Review Article

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The Significance of Tongue in Traditional Persian Medicine

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ABSTRACT

BACKGROUND AND OBJECTIVE: From the viewpoint of traditional medicine, tongue reflects internal body states. The purpose of this study is to summarize the viewpoints of Persian Medicine (PM) references regarding importance of diagnostic uses of tongue.

METHODS: Authentic PM manuscripts and perspectives of their writers were investigated in this descriptive study. We also searched online scientific databases such as PubMed, Scopus, Google Scholar, Magiran and SID for keywords such as "Tongue" and "Traditional Persian Medicine" and their Persian equivalent.

Results: In our initial survey, we obtained 208 articles that were somehow related to significance of tongue in traditional medicine; among them, 66 articles were related to diagnostic indices of tongue in Traditional Chinese medicine (TCM). No research was found to be independently dedicated to status of tongue in PM. From the viewpoint of PM manuscripts, features such as color, size, form, heaviness, dryness and wetness of tongue play a key role in diagnosing the condition of internal organs, particularly stomach, brain and liver.

CONCLUSION: According to the results of this study, although PM references emphasize on using features of tongue as diagnostic criteria, no specific pattern or category has been presented regarding diagnostic criteria of tongue so far. Therefore, designing standard tools for determining tongue features is essential in PM researches.

KEY WORDS: *Tongue, Traditional Persian medicine, Persian medicine, Mizaj (Temperament).*

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Introduction

Tongue is a muscular organ that is located on the floor of the mouth with a magnificent moving structure (1). This organ includes a group of intertwined stripy muscles that are essential for its movement and are separated with adipose tissue (2).

A mucous membrane covers the tongue and it contains special mucous cells called "taste buds". These buds receive the taste and transfer it to central nervous system. These buds make tongue the only taste organ in human body (3). Moreover, vascular and neural networks as well as tongue muscles are designed to perform various movements and they enable tongue to participate in the process of talking (4). During the process of chewing food, tongue swirls between the moving teeth with the help of cheek muscles and holds the food between upper and lower teeth without being chewed (5).

There are two groups of muscle in the tongue including internal and external ones and their duty is coordinating and moving the tongue (6). In medical schools of ancient civilizations, referring to clinical signs and patients' complaints (symptoms) were the most common methods of diagnosis. In Traditional Chinese medicine (TCM), features of tongue and pulse have been the basis of differential diagnosis of diseases (7, 8). Thousands of years ago, Chinese physicians diagnosed the state of internal body organs by examining tongue and the patterns that existed on its surface. From the viewpoint of TCM, tip of tongue indicates pathologic changes of heart, lungs and sides of tongue reflect changes in liver and gallbladder. Furthermore, the center of tongue shows pathologic changes of spleen and stomach while the features of tongue root are related to changes in kidney, bowel and bladder. In this view, tongue indices such as color, humidity, size, shape and surface of tongue are examined, while color and surface are the most important features (9).

From this perspective, tongue is observable in different conditions including pale, light, light red, dark red, dark with blue dots and fissured tongue or red dots. Natural color of tongue is light red. Pale tongue indicates blood and Qi deficiency (10). The surface of tongue is observed in white, yellow, black, slimy, thick, thin and delaminated (layered) conditions. The surface of tongue is normally light and observing any other condition is a sign of disease (11). In this school, tongue reflects the condition of internal organs, blood flow and energy of a person (12). From the viewpoint of TCM, tongue is a mirror that shows us what goes on inside the body.

Nowadays, with the advancement of TCM in scientific circles, numerous research studies have been conducted to standardize and codify diagnostic protocols of tongue and even design tongue diagnosis software to facilitate the application of diagnostic methods of TCM (13). From the viewpoint of Traditional Persian medicine (PM) references, tongue consists of muscular tissue, arteries, veins and nerves. There are endocrine glands at the end of the tongue that secrete saliva and facilitate the process of chewing by wetting the oral cavity. There are two big veins (sublingual veins) under the tongue which are divided into numerous branches on the surface of tongue.

In addition, tongue consists of special nerves and muscles that help it to move. Overall, from the viewpoint of PM, uses of tongue include moving the food while chewing and facilitating the process of swallowing food.

It is also an important organ for talking and the main organ for tasting. In addition to typical duties of the tongue, it plays a special role in diagnosing the body health or diseases. From this perspective, tongue is quickly affected by qualities of body and reflects internal body states; to the extent that some PM references refer to tongue as the illuminator of human secret in the field of health and disease (14).

PM scholars have emphasized the fact that features of tongue can reveal the temperament (Mizaj) of some organs including arteries, veins and digestive system and they frequently put emphasis on the changes in features of tongue in describing Mizaj (temperament) and Su-e-Mizaj (abnormal temperament) symptoms (15). In the case of cold abnormal temperament of liver, one of the most important liver diseases from the viewpoint of PM, whiteness of tongue is one of the diagnostic indices.

Furthermore, in many gastric diseases such as cold Abnormal temperament of stomach and other cases of dominance of pathogenic phlegm, wetness or dryness of tongue, surface of tongue and saliva features are considered as diagnostic indices (16). The color of tongue often implies disease in other organs; for

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instance, when someone has severe fever, his tongue becomes rough and black (17). In the case of jaundice, tongue becomes white while skin and other organs turn to yellow because the bile does not spill into the stomach, causing coldness and increase in the level of phlegm and its effect is visible on tongue (18). The condition and color of tongue also indicates the state of the brain. In the case of epilepsy, tongue becomes yellow and sublingual veins become green (14). In amnesia, tongue becomes white and in some cases of brain swelling, tongue becomes yellow at first and gradually tends to black (19).

Despite widespread use of diagnostic features of tongue in PM, this approach is not presented independently in PM references and most of the contents related to them are separately mentioned in the chapters of various diseases.

Due to lack of any sort of conclusion regarding these indices as a separate chapter in PM references and unclassified use of these indices by PM specialists, there is no standard method in diagnosing based on features of tongue among therapists as well as educational and research centers of PM. Identifying diagnostic protocols of tongue indices and standardizing those using modern scientific methods is essential for research in PM diagnosis.

The purpose of this study is to gather the perspectives of PM references about applications of tongue in diagnosing various body states, particularly different temperamental and organic diseases, in order to standardize and put into practice the diagnostic indices of tongue in Persian medicine using results of this study.

Methods

To conduct this descriptive study, we searched some key words such as "tongue" and "temperament" in authentic PM manuscripts including "The Canon of Medicine" by Avicenna, "Kholasa't ol Hikma" (summary of wisdom) by Aghili Khorasani, Eksir Azam (The Greatest Elixir) by Hakim Mohammad Azam Khan, "Complete Book of the Medical Art" by al-Majusi, "Akbari medicine" by Hakim Akbar Shah, "Zakhireh kharazmshahi" (The treasure of Kharazm Shah) by Ismail Jurjani, "al-Mutaallimin fi-al-Tibb" (Learner's guide to medicine) by Abu Bakr Ibn al-Arabi and "al-Mansouri fi al-Tibb" (The book on medicine dedicated to al-Mansur) by Zakariya al-Razi. Moreover, discussions regarding diseases of organs such as stomach, liver and brain that are diagnosed by tongue indices were thoroughly studied and the perspective of traditional medicine references about description and application of tongue, particularly diagnostic signs and causes, was investigated. In order to obtain the latest perspectives about significance of tongue in traditional medicine, we searched online databases such as Sid.ir, PubMed, Scopus, Magiran.com and Google Scholar for some key words such as "tongue" and "traditional medicine" and their Persian equivalent.

Results

In our initial survey, we obtained 208 articles that were somehow related to significance of tongue in traditional medicine and most of them were related to TCM; among them, 66 articles were related to diagnostic indices of tongue in TCM. The primitive articles were about collecting perspectives of TCM references while more recent texts were related to standardizing clinical methods of diagnosing tongue indices and even designing and standardizing diagnosis software using tongue in TCM.

Some of these articles were dedicated to significance of diagnosing tongue indices from the viewpoint of TCM in conventional medicine diseases. In this study, no research was found to be independently dedicated to status of tongue in PM.

Description of tongue in PM: From the viewpoint of PM references, tongue is a noble organ; it is the only taste organ in human body and the importance of a person is shown by this organ. Tongue consists of meat, arteries, veins, sensitive nerves and a membrane that extends to esophageal membranes. Some of these references, including Eksir Azam, note that the meat of tongue is soft and white and the red color we observe in examinations is due to abundant blood that flows in its veins. Nerves of tongue are branches of cranial nerves. Salivary glands are located at the lower end of tongue and the holes that secrete saliva are called "slime secretors" (19). According to Avicenna's description, tongue consists of moving muscles including: Two thin muscles (vertical muscles of

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tongue) that flatten and broaden the tongue and when one of these muscles contracts, tongue moves toward that side. Two muscles extend the tongue and help the tongue to come out of the mouth; they start from upper section of hyoid bone and are connected to the middle of tongue.

Two muscles move the tongue obliquely and help the rotational movement of tongue in the mouth; they start from lower section of hyoid bone and penetrate between muscles that extend and flatten the tongue. Two muscles reverse the tongue and finally there is a muscle that is located between the tongue and hyoid bone and pulls them toward each other (16). Aghili Alavi Shirazi et al. also concluded that tongue consists of nine muscles and their cooperation makes different movements possible (18).

In "Akbari medicine" by Hakim Akbar Shah, it is stated that tongue rotates the food to mix it and make the process of swallowing easier; tongue also helps human talk, expectorate and taste and because of its thin surface, it is quickly affected by body qualities (14). Other references also emphasized tongue's sensitivity and impressibility toward body states and qualities, in addition to typical functions such as tasting, chewing, swallowing and talking (20).

Diagnostic signs of tongue: In PM references, the main basis of diagnosing people's health or disease is on a series of clinical features that according to the way they are reported are labeled as symptoms and signs. In this approach, physician can diagnose or even predict a disease by studying symptoms and signs (21). From the viewpoint of traditional medicine, in order to obtain enough information about previous and present condition of patients, cause of the disease and prognosis, one must diagnose congenital and current temperament of patients by studying their physical and mental conditions in the past and present, color of body, features of body, pulse, urine, excretion, etc. (22). Prominent scholars of traditional medicine believed that we can discover the temperament of arteries, veins and digestive system by looking at the color of tongue.

Furthermore, in order to diagnose abnormal temperament of these organs, the color of tongue needs to be considered. Changes in size, appearance and humidity are signs of cerebral diseases. For instance, cerebral and gastric diseases are the main causes of fissured tongue and observing this condition is a sign of such diseases (17). From the viewpoint of traditional medicine texts, pathologic reasons of the tongue diseases can be diagnosed based on diagnostic symptoms of tongue. For example, tongue swellings can be categorized into sanguine, choleric, phlegmatic and melancholic; each one has its particular symptom. Symptoms of sanguine swelling include redness, tongue pain and slow secretion of saliva.

In choleric swelling, there is yellowness, pain and severe tongue irritation and if the swelling is phlegmatic, the symptoms are whiteness of tongue and increase in salivary flow. Symptoms of melancholic swelling include blackness of tongue, lack of saliva and dryness of mouth. These symptoms and other related features indicate dominance of special humor (khelt) in body that must be treated by PM physician (23). Regarding sense of taste, two terms of "void of taste" and "distortion of taste" have been used in these references. In void of taste, the patient cannot sense any taste to the extent that he/she cannot distinguish hotness from coldness.

Accumulation of excess humidity on tongue nerves is the cause of this disease. Distortion of taste which is a alteration of taste has two conditions: in the first condition, patient can sense a taste without tasting anything; while in the second condition, patient senses a taste that is different from the real taste of the food. Therefore, cause of disease in the first condition is stronger that the second one. In severe dominance of bile, the patient always feels bitterness in his mouth and in mild dominance, he cannot feel any bitterness unless he tastes a food even if the food has sweet taste. In all of the aforementioned conditions, the principle of diagnosing a disease based on the taste of mouth depends on the dominant taste of mouth; therefore, bitterness indicates dominance of bile, sweetness indicates dominance of blood or sweet phlegm, sourness indicates sour phlegm or black bile and salinity indicates saline phlegm.

The principle of diagnosing a disease based on the taste of mouth is not specific to a certain organ and this index is generally mentioned as a symptom of diagnosing disease in aforementioned organs and even general diseases of body such as general abnormal temperaments (14, 19). "Gravity of tongue" is another index of diagnosing diseases for PM scholars; a

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condition in which the form of speaking is changed and letters are not pronounced as they should. These references consider heaviness of tongue as a sign of dominance of humidity in body and organs, especially in the brain. For example, loose tongue may indicate wet abnormal temperament of brain or cerebral inflammation, swelling or trauma. Moreover, gravity of tongue is a sign of dominance of humidity in body in wet abnormal temperament of body (14).

Another practical index is the size of tongue. From the viewpoint of PM references, magnitude of tongue indicates dominance of humidity in body or organs, especially the brain. When magnitude of tongue reaches a point that tongue cannot fit in the mouth and comes out of the mouth the patient suffers from a disease called tongue thrust (Edla-o-lesan). Excess humidity that flows from head toward tongue and humidifies its different parts is the main cause of this disease. This condition indicates dominance of humidity in the brain (14).

Fissured tongue is another index for diagnosing disease of other organs. PM references have pointed out two major causes for fissured tongue. The first cause is excess dryness of brain. Dry temperament of brain affects the tongue through nervous system and fission occurs because of shrinkage of tongue. Since tongue is a soft and spongy organ, these fissures are very deep and the patient can hardly eat anything because eating sour and saline food causes a lot of pain and discomfort. In order to reach an accurate diagnosis about dryness of the brain, other symptoms such as insomnia, dryness of the nose, irritation and other signs of cerebral dryness are examined, too.

The second cause is accumulation of humors in the stomach and thus raising its vapors towards the tongue, which causes fissures as well as smoky burps. Since the source of these vapors is the presence of various types of humor in stomach, close attention must be paid to the taste of mouth to be able to differentiate them. In this respect, fissured tongue can also be considered as a symptom for diagnosing dominance of pathogenic humor in stomach (16). Dryness of tongue is another symptom that indicates dominance of hotness and dryness or presence of thick and sticky phlegm in body, especially stomach. However, other symptoms are also mentioned for each disease and the physician can reach a final diagnosis by considering all these symptoms. For example, symptoms of dominance of hotness or dryness include roughness and yellowness of tongue as well as other general symptoms of the dominance of bile (19).

Inflammation of tongue is another diagnostic symptom of tongue. Factors that cause this symptom include stomach heat, brain heat and penetration and downfall of hot humor from other organs (18). Itchy tongue is considered to be another symptom. This symptom indicates the presence of harsh and corrosive humor in tongue.

The source of this humor can be different. Sometimes it flows from head; sometimes the source is stomach or the whole body. However, like other diseases, accurate diagnosis of the source of pathogenic humor depends on other symptoms of its dominance in the organ (14).

Discussion

According to the results of this study, PM scholars, in addition to noting different functions of tongue, paid particular attention to tongue in their routine examinations and used its features to diagnose general diseases of body and specific organs.

Therefore, most features of tongue were attributed to general diseases or diseases of specific organs. PM scholars valued these symptoms to study various body statues and considered the tongue as a noble organ which reveals human body secrets. PM scholars could diagnose tongue diseases as well as diseases of other organs by tongue examination.

Avicenna and Persian scholars prior and after him attributed different symptoms of tongue to diseases of other organs as well as general diseases of body such as various abnormal temperaments. In this approach, features such as color, size, wetness and dryness, heaviness and swelling, sense of taste, inflammation, itching and fissure of tongue are considered as diagnostic signs. Overall, according to the results of this study and based on PM references, this noble organ is quickly affected by diseases of other organs and reveals various symptoms due to its subtlety. In this school, the physician must pay particular attention to the features of tongue in order to diagnose various health and disease status of body and other organs, especially brain and digestive system (16). According

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to the results of this research, the practical diagnostic abilities of the tongue have been highlighted both in the diagnosis and in follow up of the diseases. However, considering the fact that traditional medicine specialists diagnose the health and disease state of patients based on clinical findings including examination of tongue without any standard diagnostic protocols, having access to accurate documents to verify the authenticity of PM references is not possible. Validating and making these indices practical by designing and standardizing diagnostic protocols are the main priorities of PM researches. Conducting qualitative studies to express concepts and definitions of tongue indices is suggested as the first essential step after the current study. Furthermore, since a considerable part of PM and TCM principles, particularly regarding qualities of hotness and coldness, are in common and considering the efforts of TCM researchers to classify diagnostic indices of tongue in recent years (9), comparing the application of diagnostic indices of tongue in these two prominent schools of traditional medicine to make optimal use of classified diagnostic findings of TCM in PM diagnosis is suggested.

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References

1.D'Cruz AK TA, Arya S, Desai C, Chaturvedi P, Sebastian P, Verghese BT, et al.Indian council of medical research consensus document for the management of tongue cancer. indian J Med Paediatr Oncol. 2015;36(3):140-5.

2.Hussain R1, Jamshed A2, Iqbal H1, Usman S2, Irfan M2, Hafeez Bhatti AB. Long term survival and impact of various prognostic factors in T1, T2 oral tongue cancer in Pakistan. Pak Med Assoc. 2016;36(2):187-93.

3.Lin Z GX, Zhang L, Kang B, Shi J, Wu Z, Gui X, et al. Evaluation of the bitterness of traditional chinese medicines using an E-Tongue coupled with a robust partial least squares regression method. Sensors. 2016;16(2):151-7.

4.Shakeel ZA. Squamous cell carcinoma of oral tongue in young patients - A 10 years tertiary care experience. J Pak Med Assoc. 2016;66(2):155-8.

5.Kobayashi SH, Nakagawa H, Teh BG. Can Superselective Intra-Arterial chemoradiotherapy replace surgery followed by radiation for advanced cancer of the tongue and floor of the mouth?. J Oral Maxillofac Surg. 2016;7(1):145-9.

6.Maton A H, LaHart D. Human biology and health.1st,New Jersey: Prentice Hall. 1993.p.346.

7.Avijgan M, Adibi P. Characteristics of the tongue in gastroesophageal reflux disease from the perspective of traditional chinese medicine: A case-control study. J Isfahan Med School. 2013;30(217):2189-96.[In Persian].

8.Lo LC1, Chen CY, Chiang JY, Cheng TL, Lin HJ, Chang HH. Tongue diagnosis of traditional chinese medicine for rheumatoid arthritis. Afr J Tradit Complement Altern Med. 2013;10(5):360-9.

9.Kanawong R1, Obafemi-Ajayi T, Ma T, Xu D, Li S, Duan Y. Automated tongue feature extraction for ZHENG classification in traditional chinese medicine. Evid Based Complement Alternat Med. 2012;10(1155/2012/912852).

10.Lo L C, Lin H J ,Chang H H. Tongue diagnosis of traditional chinese medicine for rheumatoid arthritis. Afr J Tradit Complement Altern Med. 2013;10(5):360-9.

11.Liao PY , Hsu PC , Chen JM , Chiang JY , Lo LC. Diabetes with pyogenic liver abscess a perspective on tongue assessment in traditional chinese medicine. Comp Therap Med. 2013;12:1-18.

12.Lo LC1, Cheng TL, Chiang JY, Damdinsuren N. Breast cancer index: a perspective on tongue diagnosis in traditional chinese medicine.J Tradit Complement Med. 2013;3(3):194-203.

13.Bo Pang DZ, Zhang D Wang K. Tongue image analysis for appendicitis diagnosis.J Info Sci. 2005;175(3):160-76.

14.Shahe Arzani,Mir Mohamad Akhbar Ibn Mohamad .Tebe Akhbari. Jalaleddin. Qom. 2008.[In Persian].

15.Mojahedi M, Ebadiani M, Nazem E, Khodadoost M, Mozaffarpur SA. A review on identification mizaj (Temperament) indices in Iranian traditional medicine (ITM). J Med History. 2012;4(12):37-76. [In Persian]

16.Ibn Sina, H(Avicenna), Al-Qanun fi'l-tibb, Beirut: Dar-ol-Behar; 2009. [In Arabic]

17.Jurjani, SI. zakhireh kharazmshahi. Moharrari M, Tehran: The academi of Medical Science Islamic Republic of Iran; 2002. [In Persian]

18.Aghili Alavi Shirazi,SM Ibn Hadi H. kholasat ol hakmah, Qom. Ismailiyan. 2006. [In Persian]

19.Nazem Jahan MAK, Exir Azam. Tehran. Institute of Medical History Islamic and Complementary Medicine Iran University of Medical Sciences. 2008. [In Persian]

20.Shahe Arzani, MMA, Mofarah ol Golub(Sharhe Qanunche), Tehran: Almaei; 2005. [In Persian]

21.Razi AMIZ(Razes). Al mansuri fil teb,Tehran: University of Tehran. 2008. [In Persian]

22.Akhavini RIA, Hedayat ol Motealmin Fil Teb, Tehran: Health Tehran University of Medical Sciences. 2007. [In Persian]

23.Ahvazi AIA, Kame lo ssanaato tebbiyah,Qom: Jallaleddin. 2008. [In Arabic]

[DOR: 20.1001.1.15614107.1395.18.8.10.8]
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